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# An Experimental Study of Accounting Majors' Academic Achievement Using Cooperative Learning Groups

Alexander L. Gabbin and Lynette I. Wood

**ABSTRACT:** This study replicates the work of Hite (1996) by examining the exam re-take cooperative learning strategy. During one semester of an Intermediate Accounting II course, 68 accounting majors took exams in two-and-one-half hour night testing sessions. Students in the treatment groups took group exams immediately after individual exams, while students in the control groups left the testing site after individual exams. The results show that neither the comprehensive final nor the cumulative individual exam scores were significantly different between the treatment and control groups. Contrary to Hite's (1996) findings, this study refutes the assertion that the exam re-take cooperative learning strategy promotes accounting majors' academic achievement.

## INTRODUCTION

Studies involving various cooperative learning (CL) techniques have produced mixed results on the effectiveness of using group incentives in the classroom to improve the academic achievement of accounting students. A paucity of empirical evidence in the accounting education literature further complicates the problem of determining which CL techniques result in improved student performance. Clinton and Kohlmeyer (2005, 98) observe that "given the results of studies that have examined CL in accounting, instructors may believe the potential incremental gains do not justify implementing CL methods."

This study replicates and builds on the work of Hite (1996) who used a group exam re-take CL technique. In her study, Hite (1996) found that final exam scores for junior-level accounting students in an income tax class who took individual exams and then participated in group exam re-takes were significantly higher than the scores for students who took only individual exams. The results were statistically significant for low-, average-, and high-GPA students. As seen in Table 3, only two of eight studies involving accounting majors found that CL had an impact on academic achievement. Thus, Hite's (1996) study is important to accounting educators contemplating implementing CL in their classes.

Hite (1996) studied the treatment group tax class one year after the control group tax class had taken the same course. Hite (1996) acknowledges that "this delay could have allowed unexpected extraneous factors to influence the results." Additionally, the process the treatment group followed in taking the group exam re-takes hampers analysis of the results. Treatment group students took individual exams in one class period and the group exam on the same material (group exam re-take) two days later in the next class period. In their analysis of Hite's (1996) study, Clinton and Kohlmeyer (2005, 99) caution that

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*Alexander L. Gabbin is a Professor at James Madison University and Lynette I. Wood is an Assistant Professor at Virginia Polytechnic Institute & State University.*

treatment group student "performance may have resulted from additional time spent discussing exam content for the group condition that did not take place in the control condition."

This study makes three contributions to the current literature on CL. First, the experimental design more clearly isolates group exam re-take effects from the extraneous factors that may have influenced Hite's (1996) finding of improved academic performance. Second, this study examines the differential effect of CL on low, medium, and high academic achievers. Finally, this study examines junior and senior accounting majors in the final semester of a two-semester intermediate accounting sequence. Many of these students had already received permanent job offers or internships from Big 4 accounting firms. Thus, they are an important population for accounting educators to examine.

The following sections review literature on the effectiveness of CL in accounting courses, describe the experimental setting for this study, and report the results of the hypotheses tested. The final section discusses implications and limitations of this study.

### LITERATURE REVIEW

According to Clinton and Kohlmeyer (2005, 98), "extensive theory, research, and practice support the use of CL in all levels of education. Johnson et al. (2000) reviewed the CL literature and found more than 900 research studies that, in general, validated the effectiveness of cooperative over competitive and individualistic efforts." From an intuitive perspective, it would also appear that group effort would be better than individual effort in accomplishing a task and that group members would learn from each other in the process. Nevertheless, Lancaster and Strand (2001, 554) observe that "accounting educators have only recently reported on the use of this pedagogical method" and that this newly emerging "accounting education research has yet to arrive at a consensus of opinion regarding the efficacy of cooperative learning."

In terms of the improved content knowledge and development of higher-level thinking benefits many studies attribute to CL, research distinguishes between joint efforts that are cooperative in nature versus those efforts that are simply collaborative (Cottell and Millis 1993). The social psychology and organizational literature makes a similar distinction in contrasting student relationships viewed as "teams" (students depend on synergy, commitment, and trust among themselves to achieve a common goal) versus relationships viewed as "groups" wherein students essentially work independently and combine their individual efforts to produce an output (Bryant and Albring 2006). The significance of these perspectives to accounting educators is that care must be taken in designing and communicating objectives to the students for tasks involving joint effort. The posited benefits of CL are expected to result only from relationships where there is positive interdependence (students succeeding only when others in the joint effort do) and individual accountability among the students (Cottell and Millis 1993).

Table 1 describes a number of empirical studies that examine student academic achievement in accounting courses using various CL techniques. This table modifies and extends the work of Lancaster and Strand (2001, 552-553). Only three of the 16 studies shown in Table 1 report a significant effect at the level of  $p < .05$  on the academic achievement of CL students in accounting courses.

Table 2 summarizes the empirical studies in terms of type of accounting course, CL techniques employed to promote academic achievement, and performance measure used to assess impact on student learning.

In terms of type of accounting course, eight of the 16 studies focus on accounting majors. Significant for the purposes of this research, only one study (Hite 1996) found that

**TABLE 1**  
**Empirical Studies Examining Academic Achievement**

<u>Study<sup>a</sup></u>	<u>Course</u>	<u>CL Technique</u>	<u>Performance Measure</u>	<u>Impact on Achievement</u>
C & K 2005	Cost	Group quizzes	Final exam score	ns
L & S 2001	Managerial	Team Learning Model (TLM) Environment	Final exam score	ns
C et al. 1997	Managerial	Group Problem-Solving Workshops	Exam scores	p = .034
(a) R & B 1997	Intermediate I	Group Grade Incentive	Cumulative exam scores	ns
(b)	Cost Accounting	Group Grade Incentive	Cumulative exam scores	ns
(c)	Intermediate I	Group Grade Incentive	Cumulative exam scores	ns
(d)	Auditing	Group Grade Incentive; Student Team Learning (STL)	Cumulative exam scores	ns
(e)	Principles II	Group Grade Incentive; STL	Cumulative exam scores	ns
(f)	Principles I	Various Group Grade Incentives	Cumulative exam scores	*
(g)	Auditing	Group Grade Incentive; STL	Cumulative exam scores	ns
Hite 1996	Tax	Group Exam Re-Take	Final exam score	p = .000
(a) C et al. 1996	Principles I	CL Activities Consisting of 5 Essential Elements	Final exam score	p = .0519
(b)	Principles II	5 Essential Elements	Final exam score	ns
R et al. 1995	Principles	Group grade incentive	Cumulative exam scores; unannounced quizzes; final exam	p < .032
Wilson 1982	Principles	TLM	AICPA achievement test scores	ns
Lightner 1981	Intermediate	Group grade incentive	Cumulative exam scores	p < .10

Table 1 modifies and extends the work of Lancaster and Strand (2001, 552-553).

\* If high exam 1 score and moderate to low GPA, positive impact; if low exam 1 score, negative impact.

ns = not significant.

<sup>a</sup> References:

<u>Study</u>	<u>Author(s)</u>
C et al. 1996	Caldwell, M., J. Weishar, and G. Glezen "The effect of cooperative learning on student perceptions of accounting in the principles courses" <i>Journal of Accounting Education</i>
C et al. 1997	Ciccotello, C., R. D'Amico, and C. Grant "An empirical examination of cooperative learning and student performance in managerial accounting" <i>Accounting Education: A Journal of Theory, Practice and Research</i>

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TABLE 1 (continued)

Study	Author(s)
C & K 2005	Clinton, R. B., and J. M. Kohlmeier III "The effects of group quizzes on performance and motivation to learn: Two experiments in cooperative learning" <i>Journal of Accounting Education</i>
Hite 1996	Hite, P. "A treatment study of the effectiveness of group exams in an individual income tax class" <i>Issues in Accounting Education</i>
L & S 2001	Lancaster, K. A. S., and C. A. Strand "Using the team-learning model in a managerial accounting class: An experiment in cooperative learning" <i>Issues in Accounting Education</i>
Lightner 1981	Lightner, S. "Accounting education and participatory group dynamics" <i>Collegiate News and Views</i>
R & B 1997	Ravenscroft, S. P., and F. A. Buckless "Student team learning—Replication and extension" <i>Accounting Education (JAI)</i>
R et al. 1995	Ravenscroft, S., F. Buckless, G. McCombs, and G. Zuckerman "Incentives in student team learning: An experiment in cooperative group learning" <i>Issues in Accounting Education</i>
Wilson 1981	Wilson, W. "The use of permanent learning groups in teaching introductory accounting" Doctoral dissertation, University of Oklahoma

CL techniques had a significant effect on the academic achievement of accounting majors. In terms of CL techniques to improve performance in accounting classes, the most popular technique studied is grade incentive (Ravenscroft and Buckless 1997; Ravenscroft et al. 1995; Lightner 1981). This technique involves computing student exam grades based on a combination of individual exam performance and the average exam performance of group members. Ravenscroft et al. (1995, 101), for example, computed test score grades for CL students with the formula: (individual score)(0.70) + (group average)(.030).

As seen in Table 2, grade incentive accounted for nine of the 19 CL techniques used to improve student learning. One experiment found grade incentive to have a significant effect on student learning and two additional experiments found marginal significance. Cumulative exam scores and final exam scores are the most popular measures of student achievement. They account for 14 of the 17 performance measures.

Table 3 summarizes prior research on the effectiveness of CL techniques with accounting majors.

Research studies employed grade incentive in six of the eight studies involving accounting majors. Five of these six studies were unable to reject the hypothesis that there was no difference in academic achievement between students who were and were not exposed to CL. For the one study (Lightner 1981) that found a difference in performance between the two groups of students, the performance difference was only marginally significant.

Lightner (1981) compared the cumulative exam scores of spring semester students who were given a group grade incentive to the cumulative exam scores of the previous fall semester students who were not exposed to the CL treatment. This quasi-experimental design may have exposed the study to unintended factors. According to Clinton and Kohlmeier (2005, 99), "the quasi-experimental design may show differences that cannot

**TABLE 2**  
**Empirical Studies Examining Impact of CL Techniques on the Academic Achievement of Accounting Students**

	Number of Studies	Impact Not Significant	Significant Impact p < .05	CL Student Performance Marginally Significant p < .10
<b>Panel A: Type of Accounting Course</b>				
Principles	8	4	2	2
Intermediate	3	2		1
Cost	2	2		
Tax	1		1	
Auditing	<u>2</u>	<u>2</u>		
Total	16	10	3	3
<b>Panel B: CL Technique</b>				
Group Quizzes	1	1		
Team Learning Model	2	2		
Group Problem-Solving Workshops	1		1	
Group Grade Incentive	9	6	1	2
Student Team Learning	3	3		
Group Exam Re-Take	1		1	
CL activities with 5 essential elements	<u>2</u>	<u>1</u>	-	<u>1</u>
Total	19 <sup>a</sup>	13	3	3
<b>Panel C: Performance Measures</b>				
Final exam scores	5	3	1	1
Cumulative exam score	9	6	1	2
Unannounced quizzes	1		1	
AICPA achievement exam	1	1		
Exam scores	<u>1</u>		<u>1</u>	
Total	17 <sup>b</sup>	10	4	3

<sup>a</sup> Total is more than 16. Some studies examined more than one CL technique.

<sup>b</sup> Total is more than 16. Ravenscroft et al. (1995) used multiple performance measures.

be verified with an equivalent control group." In terms of the academic achievement of accounting majors who receive and those who do not receive CL grade incentive, the overwhelming evidence from the six studies finds no difference in performance.

## EXPERIMENTAL SETTING

### Course Description

Corporate Financial Reporting II is the second part of a two-course sequence in Intermediate Accounting. Three sections of the course meet three times weekly for 50-minute lectures over the period of a 15-week semester. The same professor has taught this course for several years. The course requires students to take three exams during the regular



**TABLE 3**  
**Impact of CL Techniques on the Academic Achievement of Accounting Majors**

<u>CL Technique</u>	<u>Number of Studies</u>	<u>Impact Not Significant</u>	<u>Impact Significant p &lt; .05</u>	<u>Impact Marginally Significant p &lt; .10</u>
Group Grade Incentive	6	5		1
Group Quizzes	1	1		
Group Exam Re-Takes	$\frac{1}{8}$	$\frac{6}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
<b>Total</b>	<b>8</b>	<b>6</b>	<b>1</b>	<b>1</b>

semester and a comprehensive final exam at the end of the semester. Students from each section take exams at the same time during special night lab sessions scheduled three times per semester from 6:30pm to 9:00pm. The three night exams plus the comprehensive final exam account for 74 percent of a student's final course grade. Students prepare two mini-research papers (20 percent) and earn teamwork points on semester exams (6 percent) for the balance of their course grade. Except for the comprehensive final exam, each exam during the regular semester contains a mixture of multiple choice questions and longer problems requiring integration of multiple accounting concepts.

Ideally, classroom instruction based on a CL model should encourage students to help each other achieve their highest level of excellence. For an instructional task to be CL, Johnson et al. (1991) maintain that five basic elements are essential: positive interdependence (students believe their individual success is dependent on group success), face-to-face promotive interaction (students orally explain solutions to each other), individual accountability (each student must contribute to receive credit for the group's success), social skills (students demonstrate leadership, decision-making, trust-building, and communication and conflict-management skills), and group process (student teams reflect on how well they are achieving their goal). Consensus is lacking on how to operationalize these elements at the postsecondary level, but research at the pre-college level suggest that small groups, individual accountability, and group interdependence are essential elements (Ravenscroft and Buckless 1997).

In addition to traditional lectures, the course in this study focuses on the five elements Johnson et al. (1991) consider essential for CL to work well. This course structure differs from Hite's (1996) study where exam strategy is the only CL pedagogical technique mentioned. Hite (1996) compares a control class (traditional course), which takes three midterm exams and a comprehensive final, to a treatment class, which adds a group exam re-take CL component to a traditional course. Table 4 summarizes the primary pedagogical techniques used in this course to promote CL and the relationship of the techniques to the five elements Johnson et al. (1991) consider essential.

### Design of Study

Students were assigned to teams based on a mix of high, low, and medium ability levels. Additionally, teams were randomly assigned to experimental and control categories. At least two teams in each section were assigned to the experimental category, "exam re-take." Similarly, at least two teams in each section were assigned to the control category,

**TABLE 4**  
**CL Elements**

<u>Classroom CL Technique</u>	<u>Positive Interdependence</u>	<u>Promotive Interaction</u>	<u>Individual Accountability</u>	<u>Social Skills</u>	<u>Group Process</u>
Final Grades <sup>a</sup>	X				
Answer Key <sup>b</sup>					X
Counseling <sup>c</sup>				X	
Freeloader Rule <sup>d</sup>			X		
Defending Team Solutions <sup>e</sup>	X	X	X	X	
Blackboard Assignment <sup>f</sup>		X	X		
Team Contract <sup>g</sup>	X	X	X	X	X

<sup>a</sup> Six percent of each student's final grade depended on teamwork points.  
<sup>b</sup> Teams reviewed and discussed the answer key with the instructor immediately after completing the team exam.  
<sup>c</sup> Instructor listened in on team members discussing solutions during the exam re-take and later counseled with students as needed.  
<sup>d</sup> Any student whose individual exam averaged was less than 64 percent was ineligible for the teamwork points earned by the team for exam re-takes.  
<sup>e</sup> Regular classes included problem sessions during which teams were assigned problems to solve with instructions that a member of the team would be called on randomly to defend the team's solution in front of the class in a management/auditor role-playing scenario.  
<sup>f</sup> Regular classes included problem sessions during which an individual student was given time to check his/her individual problem solution with team members before going to the blackboard to prepare and explain the problem solution.  
<sup>g</sup> Each team met outside of class to agree on and sign a contract documenting the groups' expectation for holding each other accountable during the semester.

“grade incentive.” The following equation models this study’s comparison of these alternative CL team strategies in terms of expected impact on accounting majors’ academic achievement:

$$\text{CL grade incentive} = \text{CL exam re-take.} \tag{1}$$

As seen in Table 3, previous research has failed, with one weak exception, to reject the null hypothesis of no difference in the academic achievement of accounting majors whose grades benefit from the CL grade incentives strategy and accounting majors whose grades are calculated in the traditional way based entirely on individual effort. In terms of impact on academic achievement, therefore, the following equation models the relationship suggested by previous research between accounting majors who receive group grade incentives and accounting majors in traditional class settings (individual only):

$$\text{CL grade incentive} = \text{Individual only.} \tag{2}$$

Equation (2) has important implications for this study. We substitute Equation (1) into Equation (2) for CL group incentive. Equation (3) models the resulting relationship examined in the current study:

$$\text{CL exam re-take} = \text{Individual only.} \tag{3}$$



Prior to the first class meeting, students on the class roster were assigned to teams within their section based on three ability levels (high, middle, and low). Student cumulative GPA and grade in Intermediate Accounting I were used to determine ability level. Each team had four to six students. Additionally, students met during the first week of classes to prepare individual team contracts that each team member signed. This contract documented the groups' expectations for holding each other accountable during the semester and had to be submitted to the instructor prior to the first exam.

### Hypotheses

The primary focus of the current study is replicating the impact Hite (1996) found on the academic achievement of accounting majors as a result of the exam re-take CL technique. Since the studies other than Hite (1996) involving accounting majors have failed to find significant improvement in performance using CL, we present the following research hypothesis:

**H1:** There will be no difference in the comprehensive final exam scores of accounting majors in the exam re-take category compared to accounting majors in the grade incentive category.

To determine whether the exam re-take CL technique helped weaker students improve their academic performance, we present the following research hypothesis:

**H2:** There will be no difference in the change in exam variance of accounting majors in the exam re-take category compared to accounting majors in the grade incentive category.

To determine if students' academic achievement is affected by their ability level, we present the following hypothesis:

**H3:** There will be no difference in the comprehensive final exam performance of accounting majors in the high, medium, and low ability levels (tiers 1, 2, and 3).

As seen in Table 2, cumulative exam score was the performance measure most used in accounting studies where CL techniques had an impact on student learning. Accordingly, we present the following hypotheses to re-examine H1 and H3 using cumulative exam score as the dependent variable:

**H4:** There will be no difference in the cumulative exam scores of accounting majors in the exam re-take category compared to accounting majors in the grade incentive category.

**H5:** There will be no difference in the cumulative exam scores of accounting majors in the high, medium, and low ability levels (tiers 1, 2, and 3).

### Description of Exam Re-Take

Table 5 shows the relationship between individual and teamwork points for each night exam.



**TABLE 5**  
**Individual Exam and Teamwork Points**

	<u>Time Allocated</u>	<u>Individual Exam Points</u>	<u>Teamwork Exam Points</u>	<u>Total Points</u>
Group Exam Re-Take Students				
Individual exam	70 minutes	100		100
Re-take exam as group (group consensus)	50 minutes		10	10
Review answer key	Variable			
Total points				110
Group Grade Incentive Students				
Independent exam	70 minutes	100		100
Group grade incentive (based on individual student scores)	Not Applicable Leave class at end of individual exam		10	10
Total points				110

For night exams during the regular semester, students took individual exams in the traditional way. However, exam re-take team members who finished early were required to remain in the class until time for the individual exam had expired. Once time expired (70 minutes), both exam re-take and grade incentive students turned in their individual exams. Students on grade incentive teams left the exam room since they had no more work to do. The teamwork points earned for grade incentive students would be calculated using scores from the individual exams of their team members. By contrast, students on the exam re-take teams remained in the classroom. Each team received a fresh copy of the exam students had just completed individually. Now, they had to complete the exam (50 minutes) as a group to earn teamwork points.

Once an exam re-take team turned in its completed group exam, team members were allowed to study an answer key with the instructor outside the classroom and ask the instructor questions on accounting issues tested in the exam that confused them. This allowed students the immediate opportunity to review exam material twice after taking their individual exam—once with their team members and again with the instructor's answer key. Students on grade incentive teams did not benefit from either the 50 minutes of additional exam time per exam to review concepts and problems with team members or the answer key with the instructor on exam night.

To discourage "hitchhikers," the course syllabus contained a "freeloader rule." Students whose individual average was less than 64 percent on the three night exams were ineligible for the teamwork points earned by their team. Instead, they received points from the teamwork pool in proportion to their individual exam average. Thus, each student had to earn at least 64 percent of the individual exam points on their own to benefit additionally from the effort of their team.

## RESULTS

To compare the effect of exam re-take and grade incentive on the academic achievement of accounting majors, this study evaluates exam performance for 68 accounting majors

enrolled in the second semester of intermediate accounting. The exam re-take teams consisted of 40 accounting majors. The grade incentive teams had 28 accounting majors.

**Tests Used**

This study tested H1 by examining students' scores on the comprehensive final exam administered at the end of the semester. Table 6 reports the results. Accounting majors in the exam re-take CL treatment group had a mean score of 73.78 on the final exam. Those working in the grade incentive control group had a mean score of 74.54. A t-test performed on the data revealed that the difference (0.76) is not statistically significant ( $t = 0.249$ ;  $p = 0.804$ ). We are unable to reject H1.

Hypothesis 2 predicted that weaker students would benefit from learning how stronger students solved exam problems—that is, stronger students would teach weaker students. On both the first and final exam, we examined the variance of each student's grade from the class mean for that exam. The change in variance from the first exam to the final exam was computed for each student, and the difference was compared for both the exam re-take CL treatment group and the grade incentive control group. Table 7 reports the results. The change in variance for accounting majors in the exam re-take CL treatment group was 2.260. For accounting majors in the grade incentive control group, the change in variance was 3.536. The 1.276 difference between the group exam re-take CL treatment group and grade incentive control group is not significant ( $t = 0.394$ ;  $p = 0.695$ ). We are unable to reject H2.

**Additional Analyses**

In addition to the primary analyses, we conducted an ANOVA to determine if accounting majors' academic achievement may have been differentially affected based on the initial tier in which they were classified. The results, presented in Table 8, reveal that tier was significantly related to performance on the final exam ( $F = 11.478$ ;  $df = 2$ ;  $p = 0.000$ ). Accounting majors with the best academic records and assigned to highest tier 1 outperformed tier 2 accounting majors on the final exam. Likewise, accounting majors assigned

**TABLE 6**  
Comparison of Comprehensive Final Exam Scores by Treatment

<u>Treatment</u>	<u>Final Exam Mean</u>	<u>Std. Dev.</u>	<u>Sample Size</u>
Group exam re-take	73.78	11.125	40
Group grade incentive	74.54	14.017	28

t-statistic: 0.249  
p-value: 0.804

**TABLE 7**  
Change in Variances by Treatment

<u>Treatment</u>	<u>Variance Change</u>	<u>Std. Dev.</u>	<u>Sample Size</u>
Group exam re-take	2.260	11.285	40
Group grade incentive	3.536	15.455	28

t-statistic: 0.394  
p-value: 0.695

**TABLE 8**  
**Final Exam Student Performance by Tier and Team Configuration**

<u>Treatment</u>	<u>Tier</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Group grade incentive	1	81.58	6.360	12
	2	73.71	7.135	7
	3	65.78	20.198	9
	Total	74.54	14.017	28
Group exam re-take	1	81.36	9.476	14
	2	72.92	6.973	12
	3	66.93	11.283	14
	Total	73.78	11.125	40
Combined	1	81.46	8.031	26
	2	73.21	6.844	19
	3	66.48	14.963	23
	Total	74.09	12.303	68
		<u>df</u>	<u>F</u>	<u>Sig.</u>
Team Configuration		1	0.000	0.988
Tier		2	11.478	0.000
Team Configuration * Tier		2	0.043	0.958

to the middle tier 2 scored higher than their counterparts in the lowest tier 3. No interaction between tier and the team treatment was observed ( $F = 0.043$ ;  $df = 2$ ;  $p = 0.958$ ). We reject H3. The entry-level academic ability of accounting majors was a significant determinant of performance for both grade incentive and exam re-take students.

We also used accounting majors' cumulative exam average (which included three exams and the comprehensive final exam) as the dependent variable. The results were essentially the same as those in the original analyses where the comprehensive exam score was the dependent variable (see Table 9). Accounting majors in the exam re-take CL treatment group had an average exam score of 73.73. Accounting majors in the grade incentive control group averaged 75.29. There was no statistically significant difference in cumulative exam average between the exam re-take CL treatment group and grade incentive control group ( $t = 0.595$ ;  $p = 0.554$ ). Similar to H1 using the comprehensive final exam, we are unable to reject H4 using cumulative exam scores.

In addition, we tested to see how the tier in which students initially were classified related to cumulative exam average. Similar to the findings when using the final exam as the dependent variable, we found that tier is significantly related to cumulative exam average ( $F = 18.333$ ;  $df = 2$ ;  $p = 0.000$ ; see Table 10). No interaction between tier and the team treatment was observed ( $F = 0.542$ ;  $df = 2$ ;  $p = 0.584$ ). We reject H5.

**DISCUSSION AND LIMITATIONS**

The current study failed to find a significant difference in the performance of accounting majors who invested additional time in exam re-take and accounting majors who received grade incentive (Equation (1)). Thus, accounting educators will not receive improved academic performance from their students for the additional class time invested in accounting majors taking the same exam twice—once as individuals and again in a CL group. The exam re-take CL group did not perform significantly better than students who took exams in a traditional format and received a CL grade incentive.



**TABLE 9**  
**Comparison of Cumulative Exam Averages by Treatment**

<u>Treatment</u>	<u>Cumulative Exam Mean</u>	<u>Std. Dev.</u>	<u>Sample Size</u>
Group exam re-take	73.73	10.254	40
Group grade incentive	75.29	11.181	28

t-statistic: 0.595  
p-value: 0.554

**TABLE 10**  
**Student Performance on All Exams by Tier and Team Configuration**

<u>Treatment</u>	<u>Tier</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Group grade incentive	1	80.46	8.620	12
	2	78.39	5.629	7
	3	66.00	12.263	9
	Total	75.29	11.181	28
Group exam re-take	1	81.42	8.875	14
	2	73.96	5.171	12
	3	65.86	9.145	14
	Total	73.73	10.254	40
Combined	1	80.97	8.596	26
	2	75.59	5.633	19
	3	65.91	10.203	23
	Total	74.38	10.591	68
	<u>df</u>	<u>F</u>	<u>Sig.</u>	
Team Configuration	1	0.312	0.578	
Tier	2	18.333	0.000	
Team Configuration * Tier	2	0.542	0.584	

A second major finding in this study is based on Equation (2). Previous research studies comparing individual only control groups to CL grade incentive groups strongly suggest that the grade incentive CL strategy does not promote student learning for accounting majors (Equation (2)). Using Equation (3), this study further demonstrates the exam re-take CL strategy likewise does not promote student learning better than the traditional individual only exam format. This is a significant finding and contradicts the results in Hite's (1996) study.

The exam re-take CL strategy does not improve accounting majors' academic achievement. This result holds for high, medium, and low ability students and for both comprehensive exam score and cumulative exam score as performance measures. In terms of academic achievement, accounting majors who started the course with the best academic records outperformed accounting majors with medium-level academic records, and the medium ability students outperformed low ability accounting majors.

While the available evidence in studies focusing on accounting majors does not support the popular belief that CL techniques promote student learning, this observation does not mean that CL techniques have no place in accounting education pedagogy. Research has not found CL techniques to be harmful to accounting majors' academic achievement. This

is important. There are benefits worth pursuing from CL other than academic achievement. Future research should include consideration of CL benefits other than performance.

Improvement in affective measures, usefulness in accounting careers, and minimization of student-instructor conflicts are important benefits that may be associated with CL for accounting majors (Hite 1996). For example, the annual Colloquium on Change in Accounting Education's ongoing theme for several years was "Taking Back the Classroom." The conference primarily focused on providing faculty with skills and ideas for dealing with students who are demanding, feel entitled, and do not take responsibility for their own learning (Smith 2004). These students are symptomatic of the Generation Y new hires accounting firms are struggling to accommodate in a Sarbanes-Oxley-induced marketplace for accounting talent. One of the authors of the current study has found the exam re-take CL strategy to be an excellent pedagogical tool for holding students accountable for their own learning, promoting professionalism, and minimizing conflicts over test questions and grades.

Finally, the reason for the failure of CL strategies to improve accounting majors' academic achievement also needs to be investigated. Given the widespread support of CL for other student populations (Ravenscroft and Buckless 1997), the failure of studies in accounting education to replicate this success among accounting majors needs to be examined. Perhaps accounting majors are motivated in ways that differ from other student populations. The intense competition among Big 4 accounting firms in recruiting junior and senior accounting majors may also be a significant influence on student motivation to perform in classes. Anecdotal evidence suggests that students with Big 4 job offers tend to focus on the minimum performance necessary to pass their remaining courses prior to the degree rather than earn the best grade they can get.

This study has several limitations. First, the direct comparison in this study is between two different CL techniques, exam re-takes and grade incentives. The study found that academic achievement was not affected by these alternative CL strategies. While valuable in its own right, the comparison of alternative CL strategies is of secondary importance in this study. Of critical importance in this paper is the assumption that CL grade incentive is essentially a placebo for students who do not receive the exam re-take CL treatment. This assumption is based on the inability of previous research to demonstrate that a CL grade incentive strategy has any impact on student learning. Therefore, we feel justified in concluding that the exam re-take CL technique also has no impact on student learning. Second, the accounting majors in this study were not randomly selected. While we believe the accounting majors used in this study are typical of students in many AACSB undergraduate accounting programs, interpretation of our results is limited by this bias. Third, the number of students in the study dropped from an initial enrollment of 81 to 68 students completing the course. While this drop rate is not unusual for this course and no team sizes fell below the three students needed to maintain continuity, this may have influenced the results.

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